WHAT IS CLAIMED IS:

1. A semiconductor wafer with a front surface and a back surface and an epitaxial layer of semiconducting material deposited on the front surface,

wherein a surface of the epitaxial layer has a maximum density of 0.14 localized light scatterers per cm^2 with a cross section of greater than or equal to 0.12 µm; and

the front surface of the semiconductor wafer, prior to the deposition of the epitaxial layer, has a surface roughness of 0.05 to 0.29 nm RMS, measured by AFM on a 1 µm × 1 µm reference area.

2. A process for producing a semiconductor wafer with a front surface and a back surface and an epitaxial layer of semiconducting material deposited on the front surface, wherein the process comprises the following process steps:

(a) a stock removal polishing step as the only polishing step;

(b) cleaning and drying of the semiconductor wafer;

(c) pretreating of the front surface of the semiconductor wafer at a temperature of from 950 to 1250 degrees Celsius in an epitaxy reactor; and

(d) depositing of the epitaxial layer on the front surface of the pretreated semiconductor wafer.

3. The process as claimed in claim 2, comprising

polishing the front surface and the back surface of the semiconductor wafer simultaneously during the stock removal polishing.

4. The process as claimed in claim 2, comprising

polishing only the front surface of the semiconductor wafer during the stock removal polishing.

5. The process as claimed in claim 2, comprising

carrying out the pretreating referred to in step (c) immediately before the epitaxial depositing in the epitaxy reactor.

6. The process as claimed in claim 2, comprising

treating the semiconductor wafer, in a first step of the pretreating according to step (c), in a hydrogen atmosphere at a temperature of from 950 to 1250 degrees Celsius.

7. The process as claimed in claim 2, comprising

treating the semiconductor wafer, in a second step of the pretreating according to step (c), at a temperature of from 950 to 1250 degrees Celsius in a hydrogen atmosphere to which gaseous HCl has been admixed; and removing from 0.01 to 0.2 µm of material from

the surface of the semiconductor wafer at an etching rate of 0.01 µm/min to 0.1 µm/min.

8. The process as claimed in claim 2,

wherein the epitaxial layer deposited in step (d) has a thickness of 0.3 µm to 10 µm and is deposited at a temperature of from 600°C to 1250°C.

9. The process as claimed in claim 2,

wherein the epitaxial layer deposited in step (d) is rendered hydrophilic using an oxidizing gas.

10. The process as claimed in claim 2,

wherein the epitaxial layer deposited in step (d) is rendered hydrophilic by wet-chemical means.

11. In a method for producing integrated semiconductor components, the improvement which comprises

utilizing an epitaxially coated semiconductor wafer produced by the process of claim 2 for producing said components.